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## Enhancing Breast Cancer Treatment Through PET-MRI: A Game-Changing Approach



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*Researchers Dr Rosa Di Micco & Professor Oreste Gentilini*

A groundbreaking study presented at the [14th European Breast Cancer Conference](#) showcased the potential benefits of using a combined positron emission tomography-magnetic resonance imaging (PET-MRI) scanning technique in the treatment of early-stage breast cancer. Conducted by Dr Rosa Di Micco, a breast surgeon from IRCCS San Raffaele University and Research Hospital in Milan, Italy, this research provided compelling evidence that integrating PET-MRI scans into the standard care protocol could significantly enhance treatment outcomes for a substantial proportion of patients.

### Challenges in Traditional Diagnostic Methods and the impact of PET-MRI

Traditionally, the standard diagnostic tools for early breast cancer include mammography, ultrasound, and occasionally MRI. However, Dr Di Micco highlighted that these methods may not always detect early signs of tumour spread or metastasis accurately. In contrast, the PET-MRI scanning technique offers a more comprehensive and detailed view, enabling physicians to identify subtle indicators of cancer progression. This capability is crucial, as it allows for timely interventions and adjustments to treatment plans, potentially improving patient outcomes and survival rates.

### Balancing Benefits and Risks of PET-MRI for Better Outcomes

The study involved 205 patients who were undergoing treatment at San Raffaele Hospital between July 2020 and October 2023. Before undergoing breast-conserving surgery to remove the tumour, each patient received a PET-MRI scan to assess the extent of cancer spread within the affected breast, surrounding tissues, and the rest of the body. Remarkably, the results revealed that in 57 out of the 205 patients (27.8%), their treatment plans were modified based on the findings from the PET-MRI scans. These alterations included initiating chemotherapy as a first-line treatment or opting for different surgical approaches, such as mastectomy, removal of additional lymph nodes, or surgeries on both breasts. However, it is worth noting that in 12 out of the 57 patients (21%) whose treatment plans were revised, the additional tissue removed during surgery was later determined to be benign. While this highlights the potential risk of over-treatment or unnecessary interventions based on PET-MRI scan results, Dr Di Micco stressed the importance of balancing the benefits and risks. She emphasised that despite the presence of false positives, the PET-MRI scans provide valuable insights that can help clinicians make more informed and personalised treatment decisions.

### Innovative Applications: Targeting Hormone-Influenced Breast Cancer with PET-MRI

Professor Oreste Gentilini, who led the study, echoed Dr Di Micco's sentiments and emphasised the transformative potential of PET-MRI in refining the treatment strategies for breast cancer patients. He acknowledged that, while these are early results from an ongoing study, they indicate that PET-MRI could be a game-changer in the field of breast cancer care. Professor Gentilini also highlighted the need for further research and validation to optimise the accuracy and reliability of this innovative imaging technique. In addition to the current study, Dr Di Micco and her team are embarking on a new research endeavour that focuses on utilising a modified PET-MRI approach. This innovative technique aims to detect breast cancer cells that are influenced by the female hormone oestrogen, which could be particularly beneficial for patients with lobular breast cancer. Lobular breast cancer is often more challenging to detect using conventional mammograms or ultrasound scans, making early diagnosis and treatment planning critical for improving outcomes.

The promising findings from this study highlight the transformative potential of PET-MRI scans in guiding personalised and optimised treatment strategies for early-stage breast cancer patients. While some challenges and limitations need to be addressed, such as false positives and the risk of over-treatment, the integration of PET-MRI into standard care protocols could pave the way for improved patient outcomes, reduced morbidity, and enhanced quality of life for breast cancer patients worldwide. Further research and prospective studies are warranted to validate these findings and optimise the use of this innovative imaging technique in clinical practice.

Source: [14th European Breast Cancer Conference](#)

Image credit: [EORTC/Rosa Di Micco](#)

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